Cosmic Egg Genesis: A Singularity-Driven Emergence from a Parent Universe via Cosmic Fiber and Recursive Black Hole Cosmogenesis

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Abstract

We propose a speculative cosmological framework in which our universe originates from the singularity of a black hole in a still-existing parent universe. This singularity, conceptualized as a 'cosmic egg,' traverses a high-tension conduit termed the 'cosmic fiber' due to extreme gravitational collapse and Planck-scale density. Upon emergence, the egg undergoes rapid inflation, triggering the Big Bang. We further posit that every black hole acts as a generator of new universes, carrying the complete informational imprint of its parent universe — including light, matter, energy, and structure — into its singularity. This singularity becomes the cosmic egg of a new universe, forming a recursive multiversal tree. The model integrates black hole thermodynamics, scalar field inflation, entropy evolution, and holographic information conservation, offering a metaphysical and mathematical justification for cosmogenesis.

I. Introduction

The Big Bang theory describes the expansion of our universe from an initial singularity but does not explain the origin or recursive potential of that singularity. We propose a model where our universe is seeded by the singularity of a black hole in a parent universe, which acts as a cosmic egg. This egg transits through a cosmic fiber, a high-tension spacetime filament, and expands into a new universe. Furthermore, black holes within any universe serve as birthing points for new universes, forming a fractal-like multiversal tree. This concept draws from Smolin’s fecund universes, Penrose’s cyclic cosmology, and holographic black hole models.

II. Black Hole Singularity as Cosmic Egg

Each black hole BH_i in a universe U_n contains photons, matter, energy, and quantum information. The singularity S_i becomes a cosmic egg E_i, encapsulating the entire informational state of U_n. This egg can tunnel through a cosmic fiber F_i and expand into a new universe U_{n+1}, initiating a Big Bang.

III. The Big Bang as Egg Expansion

Upon exiting the cosmic fiber, the cosmic egg undergoes inflation governed by Friedmann equations and scalar field dynamics. Entropy evolution is modeled using Bekenstein-Hawking entropy, and this expansion marks the Big Bang, releasing entropy and unfolding spacetime.

IV. Recursive Multiversal Tree Structure

We define a recursive function U(n) representing universe generation: U(n+1)=Σf(BH_i^(n)), where f(BH) maps black hole singularities to new universe births. The total number of universes follows N_total=ΣB^k, describing a fractal-like multiverse.

Mathematical Framework

1. **Entropy Transfer**

$S_{new}=S_{BH}+\text{delta } S_{inflation}$

2. **Scalar Field Inflation**

$V(\square)=1/2\ m^2\ \square^2$, epsilon = ½ $(v'/v)^2$ <<1

3. **Recursive Expansion**

$a_{n+1}(t)=a_n(t).e^{Hn+1t}$, $H_{n+1}=\text{sqrt}\{8\pi G/3 \text{ rho }_{n+1}\}$

4. **Multiversal Tree Depth**

$$N_{total}=\sum_{k=0}^{D} B^k$$

Where D is depth and B is branching factor.

V. Unified Relationship Among Components

BH → S_i=E_i
S = lim (ρ → ∞)
E = S_BH
F : S → U_new
a(t) ~ e^{Ht}
U(n+1)=Σf(BH)

VI. Literature Context

- Smolin's Fecund Universes: Black holes spawn new universes with inherited constants.
- Penrose's Cyclic Cosmology: Universe recycling via conformal geometry.
- Holographic Principle: Black holes encode all information on their event horizon.
- Quantum Tunneling: Singularity may tunnel into new spacetime.
- String Theory Branes: Collisions and folds in higher-dimensional space can birth universes.

VII. Implications and Extensions

- Information Conservation: Each universe inherits structure from its parent.
- Fractal Multiverse: Recursive tree resembles a fractal cosmogenesis.
- Entropy Evolution: Entropy increases across generations.
- Myth-Science Parallel: Echoes cosmic egg myths and tree-of-life archetypes.

VIII. Conclusion

This manuscript presents a recursive cosmological model where the singularity of a black hole in a parent universe becomes the cosmic egg of our universe. Every black hole acts as a generator of new universes, forming a multiversal tree governed by scalar field inflation, entropy transfer, and holographic information conservation. The framework bridges speculative physics, quantum gravity, and mythic metaphor, offering a novel justification for the Big Bang and multiverse formation.

References

[1] L. Smolin, The Life of the Cosmos, Oxford University Press, 1997.

[2] R. Penrose, Cycles of Time, Bodley Head, 2010.

[3] G. ’t Hooft, “Dimensional reduction in quantum gravity,” arXiv:gr-qc/9310026, 1993.

[4] S. Coleman, “Quantum tunneling and false vacuum decay,” Phys. Rev. D, vol. 15, pp. 2929–2936, 1977.

[5] J. Polchinski, String Theory, Cambridge University Press, 1998.